

STRV RADMON

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This presentation describes the design, calibration, and operation of the RADMON, Radiation Monitor. Each RADMON consists of a 4-kbit SRAM and two p-FETs that were fabricated using a standard 1.2- μ m CMOS process. The flight box contains 16 RADMONs; half of the RADMONs are shielded by 2 mm of Al where the expected annual dose is 200 krad. The other half are located behind 5.5 mm of Al where the expected annual dose is 8 krad. The SRAM detects particle upsets and is sensitive to 0.5 to 2 MeV protons. The sensitivity to particle upsets is controlled via an offset voltage. SRAMs are operated in three bins: the first bin detects protons, alphas, and heavy ions; the second bin detects alphas and heavy ions; and the third bin detects heavy ions. The p-FETs detect total ionizing dose and have a sensitivity of 1.5 mV/krad. The RADMON will be used to profile the earth's proton belts, measure the total radiation dose, and to detect cosmic rays. The results of this detector will be compared to results from the CREDO (DRA) and 13h4 (ESA/ESTEC). The overall objective is to validate space test results with ground tests, to aid in the design of robust and reliable space systems, and to update the radiation models.